Uncertainty Quantification for Atmospheric Entry of Space Vehicles

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Atmospheric entry

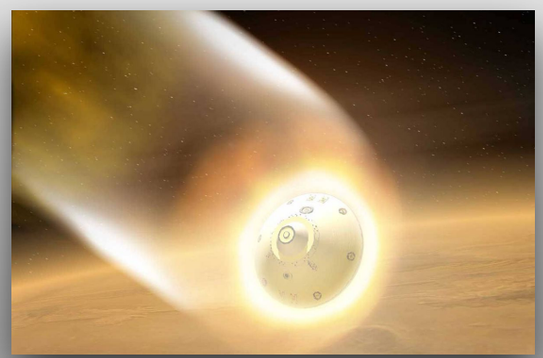
plays an essential role in Space mission design

The branch of Science that studies the physico-chemical phenomena present in atmospheric entry is called AEROTHERMODYNAMICS

Aerothermodynamics is present in many Space applications

Access to LEO

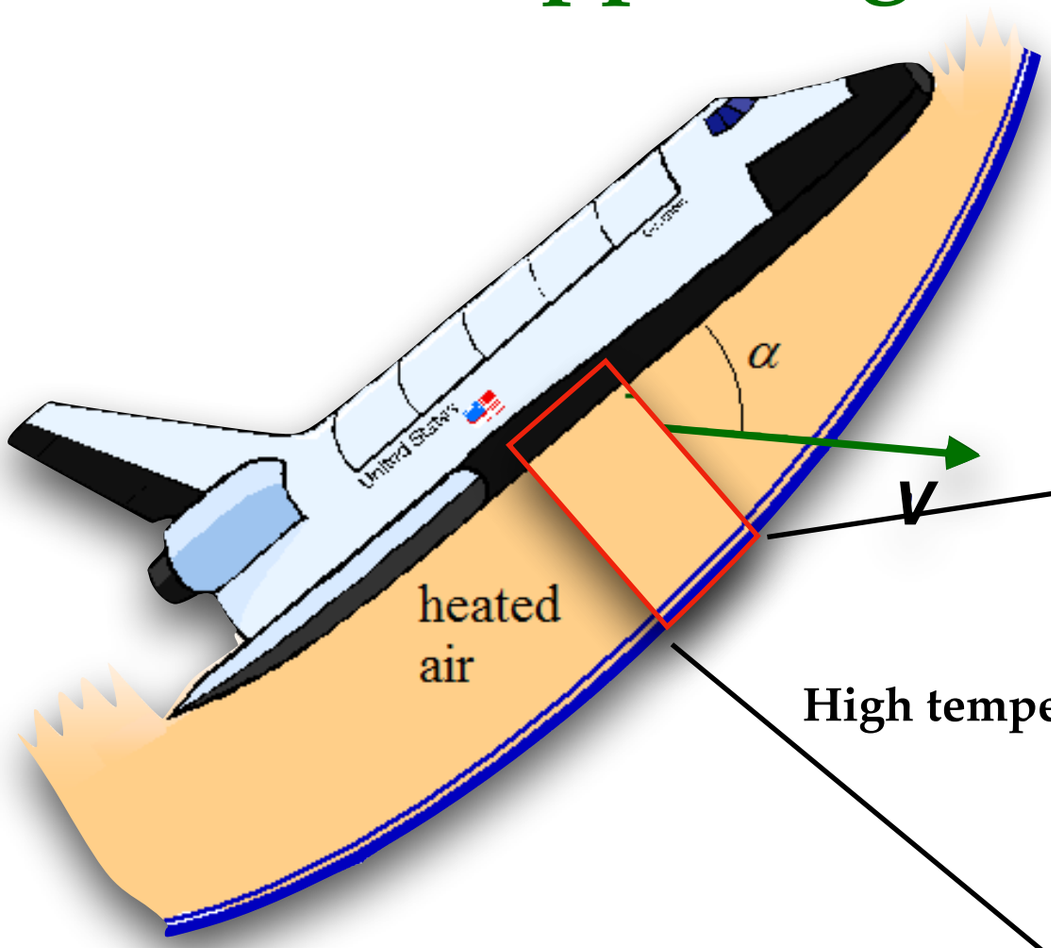
Space Exploration



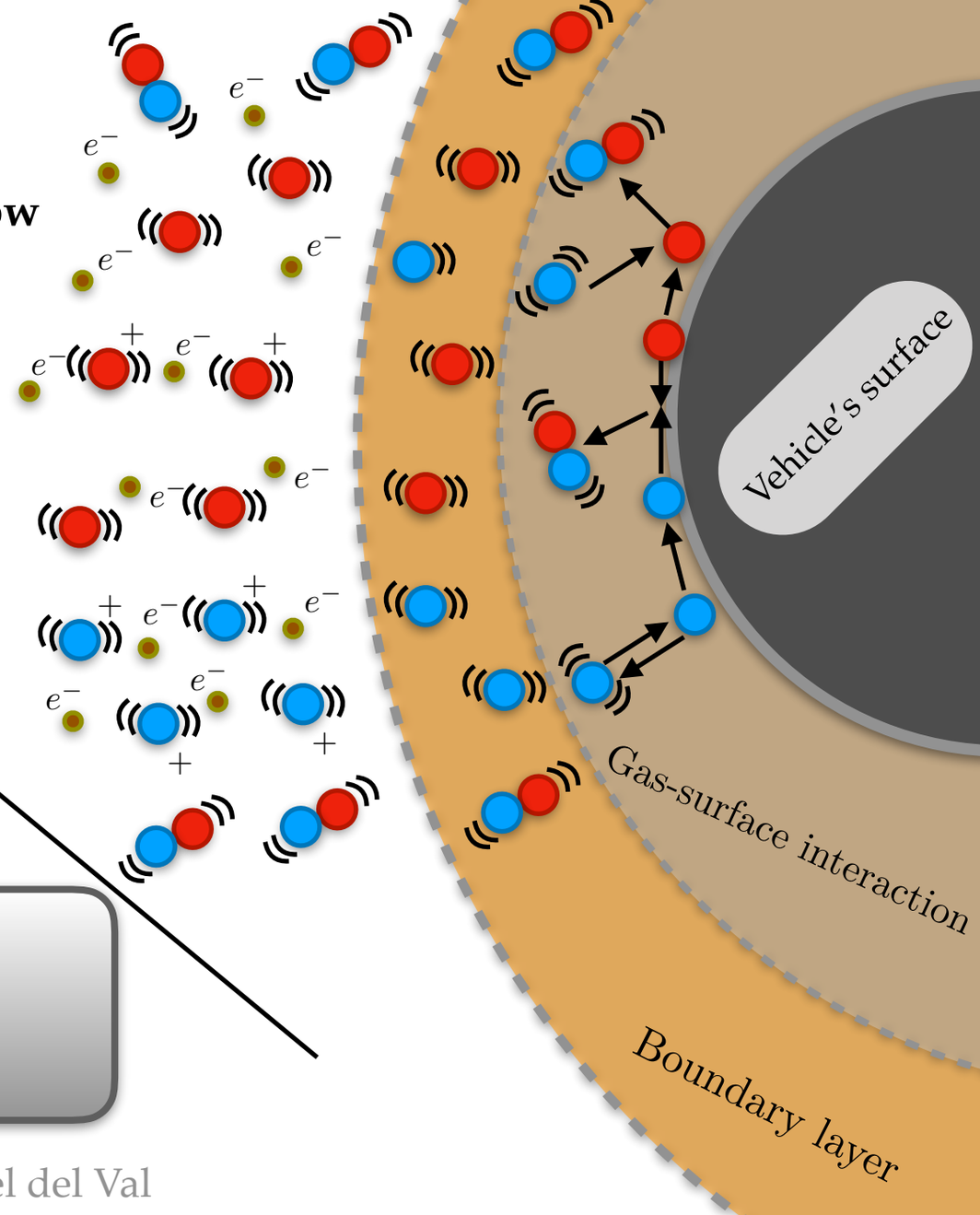
Meteor phenomena

The common denominator is a complex gas-surface interaction phenomena

What is happening on the vehicle surface?



High temperature dissociated flow



The complexity and presence of different processes calls for the use of Uncertainty Quantification (UQ) methods

UQ has the potential of making designs more robust and efficient under severe lack of knowledge of the phenomena involved

Full integration for predictive science

results in better designs